

**REMARKS/ARGUMENTS**

Reconsideration of this application in light of this response to the rejection set forth in the Office Action having a mailing date of June 16, 2005 is requested.

Claims 1-20 are pending in the application. Independent Claims 1 and 14 have been amended to clearly note the invention, which is distinct from the prior art. Support for the amendments is found in Applicants' specification paragraph [0010], page 2, lines 30-32 and the example which is described in paragraphs [0025-0027].

**Rejection of Claims 1-9 and 12-20 Under 35 USC 103(a) Over Woytek, et al US 4,091,081**

Beginning at paragraph 2 of the Office Action, Woytek, et al was cited as disclosing a method for preparing  $\text{NF}_3$ , including the removal of HF therefrom, and recovering  $\text{NF}_3$ . Woytek, et al was admitted as failing to disclose the removal of fluorine and nitrogen oxides, but the removal of such substances was alleged to have been obvious to one skilled in the art faced with producing a purified  $\text{NF}_3$  product.

The Examiner continued with a claim by claim analysis of the dependant claims pointing out the relevance of the numerous teachings in Woytek, et al to those claims, e.g., contact with KOH, which would include alkaline earth hydroxides, including magnesium or calcium hydroxide.

In terms of Claims 13 and 19-21, the disclosure of molecular sieve driers in Woytek, et al was alleged to be suggestive of carbon molecular sieves, etc.

**Summary of Applicants' Invention as Set Forth In Independent Claims 1 and 14**

It is respectfully submitted that the Examiner has failed to grasp the substance of the claimed invention, in relation to the prior art, and Applicants' solution to the problem of absorber life in the removal of nitrogen oxides associated with the purification of  $\text{NF}_3$ .

Applicants found that if one removed HF and F<sub>2</sub> from an NF<sub>3</sub> reaction product, e.g., an NF<sub>3</sub> reaction product resulting from the fluorination of ammonium bifluoride, **without generating OF<sub>2</sub>**, one could extend the life of the adsorber beds employed in removal of nitrogen oxides. This aspect was clearly set forth in independent Claims 1 and 14. The present amendments further delineate the sequence of steps associated with Applicants' process, noting that the HF and F<sub>2</sub> are removed without forming OF<sub>2</sub> prior to removing the nitrogen oxides.

Response to the Rejection of Claims 1-9 and 12-20 Under 35 USC 103(a) Over Woytek, et al

US 4,091,081

Having pointed out the features of Applicants' invention, the differences vis-à-vis Woytek, et al become apparent. Woytek, et al in the formation of NF<sub>3</sub> via the fluorination of ammonium bifluoride **does remove HF and F<sub>2</sub>**, in contrast to the Examiner's statement at page 2 of the Office Action. Woytek, et al pass an NF<sub>3</sub> reaction product through a trap, then through KOH, and then through a cold trap to remove water (col. 5, lines 18-27). Unreacted F<sub>2</sub> is present in this stream, and because water is present, OF<sub>2</sub> is formed. It is this series of steps involving the removal of F<sub>2</sub> from the NF<sub>3</sub> reaction product, which is in **direct contrast to Applicants' claimed invention**.

Applicants acknowledged the Woytek, et al process in their specification at paragraph [0002], page 2, and point out its deficiencies in their paragraph [0014] page 3. As Applicants state, OF<sub>2</sub> is produced in small amounts when fluorine is removed in an NF<sub>3</sub> purification, when the reaction product is passed through aqueous KOH.

A secondary flaw in the Examiner's analysis of the claimed subject matter is noted in the rejection of Claims 2, 4-6 and 15-18, wherein the Examiner notes that Woytek, et al disclose the use of KOH, and thus, is suggestive of the use of other alkaline hydroxides. It should be noted that Applicants are careful to point out that the removal of F<sub>2</sub> and HF with

these compounds is done **without producing OF<sub>2</sub>**. As Applicants point out in paragraphs [0015], [0016], and [0018] pages 4 and 5 of Applicants' specification, water is to be avoided when F<sub>2</sub> is present, and thus, the hydroxides employed are anhydrous. This feature is set forth in Claims 4 and 6, and they are included in Claims 6 and 18.

With respect to the Examiner's allegation at the bottom of page 2 of the Office Action, that it would have been obvious to one of ordinary skill in the art to remove fluorine and nitrogen oxide from an NF<sub>3</sub> reaction product produced from reactant oxygen difluoride, it is asserted that process would not meet the requirements of Claim 1. It would be expected that the reaction product from such a stream would not be free of unreacted OF<sub>2</sub>. It would not meet the elements of Claim 14, per the language that **NF<sub>3</sub> is formed by the fluorination of ammonium bifluoride**. The analysis is irrelevant in terms of 35 U.S.C. §103(a).

Summarizing, in view of the fact that Woytek, et al does not teach or direct one to avoid the formation of OF<sub>2</sub> in NF<sub>3</sub> production and purification, and in fact, Woytek, et al does just the opposite, Woytek, et al **does not establish a *prima facie* case of obviousness** of the claimed subject matter, and thus, cannot form the basis for the rejection of independent Claims 1 and 14 under 35 U.S.C. §103(a). It follows, *a fortiori*, that a rejection of Claims 2-9, 12, 13, and 15-19, which are ultimately dependant from independent Claims 1 and 14, cannot be made in view of the failure of Woytek, et al to establish a *prima facie* case of obviousness.

Rejection of Claims 10 and 11 Under 35 USC 103(a)

Over Woytek, et al US 4,091,081 In View of Aritsuka, et al US 4,933,158

The Examiner rejected Claims 10 and 11 over the above cited references on the basis that it would have been obvious to use the zeolites of Aritsuka, et al in the NF<sub>3</sub> purification process of Woytek, et al.

Response To Rejection of Claims 10 and 11 Under 35 USC 103(a)

Over Woytek, et al US 4,091,081 In View of Aritsuka, et al US 4,933,158

It is respectfully submitted that Aritsuka, et al is irrelevant to the invention as claimed, because they do not address the removal of  $F_2$  and HF in the initial step of the purification process. Aritsuka, et al are concerned with the removal of  $N_2O$ ,  $CO_2$  and  $N_2F_2$  from  $NF_3$  in the second phase of Applicants' claimed process. Absent, a teaching to avoid the formation of  $OF_2$  in the initial removal of  $F_2$  and HF from an  $NF_3$  reaction product, a ***prima facie* case of obviousness has not been made** by the references.

Applicant's appreciate the examiner's indication of allowability of Claim 7 which has now been made independent and should be allowed.

Closing

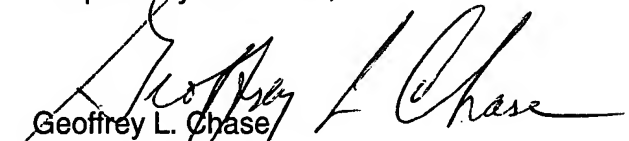
Summarizing, the references cited by the Examiner are the same as Applicants have identified in their specification, noting the problem of reduced adsorber life in the removal of HF,  $F_2$ , nitrogen oxides and  $CO_2$  during  $NF_3$  purification. Applicants pointed out in their specification that  $OF_2$  is generated when  $F_2$  is removed via contact with aqueous KOH as was done by Woytek, et al. The cited prior arts' failure to teach to the avoidance of  $OF_2$  formation in the purification process is fatal to maintaining a rejection under 35 U.S.C. §103(a) of all claims now pending.

Appl. No. 10/763,365

Applicant respectfully requests that the examiner reconsider the pending claims and withdraw the rejection and pass the case to issue.

A petition for extension of time to make this response timely is separately requested.

Respectfully submitted,

  
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Attachment: Petition for 3 Month Extension of Time